CLAIMS

1. A controller for a Raman amplifier having a plurality of pump lasers that produce light centered at different wavelengths so as to provide WDM pump light, comprising:

a memory configured to hold computer-readable instructions and data, said data being arranged in a plurality of sets of drive conditions for said plurality of pump lasers, each of said sets of drive conditions corresponding to a different target profile, each different target profile including multiple wavelength samples distributed across an amplification bandwidth; and

a processor having an interface configured to communicate with external devices, said processor configured to execute said computer-readable instructions and implement a target setting mechanism and a parameter application mechanism, wherein

said target setting mechanism is configured to identify a target profile and corresponding operating parameters for the plurality of pump lasers to achieve the target profile, said operating parameters including a set of said plurality of sets of drive conditions, said target profile relating to an operational condition provided to said processor from at least one of said external devices, said target profile having multiple samples and being at least one of

a predetermined amplification profile having the multiple samples specified across the amplification bandwidth, said amplification bandwidth being a contiguous bandwidth at least as large as a signal bandwidth of a WDM optical signal that is amplified by said Raman amplifier while propagating through an optical fiber, and

an output signal level profile having the multiple samples specified across said amplification bandwidth,

said parameter application mechanism is configured to output at least one control signal that defines said operating parameters so as to adjust an amount of light introduced into said optical fiber from said plurality of pump lasers, and

said target setting mechanism is configured to compare the multiple samples of said target profile with corresponding samples obtained by monitoring an actual profile so as to determine whether each sub-band of a plurality of sub-bands of said actual profile is within a predetermined tolerance of said target profile across said amplification bandwidth so that said controller can make an adjustment to any of the

plurality subbands of said actual profile that is not within said predetermined tolerance.